I. Introduction

1. The problems of food production and security have been discussed in many forums in Africa and elsewhere. At the Twenty-first Ordinary Session of the assembly of Heads of State and Government of the Organization of African Unity (OAU), 18-20 July 1985 Africa's Priority Programme for Economic Recovery 1986-1990 (APPER) was adopted. The APPER lays considerable emphasis on the food and agriculture sector (OAU) (1985). With respect to the development of agriculture, immediate and medium term measures to combat food emergencies have been suggested. The immediate measures include: creating and sustaining national emergency preparedness; instituting effective early warning systems; establishing flexible and efficient regional networks of crop protection agencies; and establishing national food security arrangements. Some of the medium term measures which have been suggested include: increase in food production; improving and expanding storage capacity, distribution and the marketing system; and improvement of the distribution of agricultural products. All these suggested measures will contribute to the strengthening of food security information systems in African countries.

2. On 1 June 1986, the United Nations General Assembly adopted a programme of Action for African Economic Recovery and Development, 1986-1990 (UNPAAERD). The programme has essentially two elements namely the determination and commitment of the African countries to launch national and regional programmes of economic development as contained in the APPER which was adopted by the African Heads of State and Government in July 1985 and the response and commitment of the international community to complement and give support to the African development efforts (UN 1986).

3. The recent drought - induced emergency situation of 1983-1985 which was experienced in Africa needs to be mentioned here. This caused some African countries to rely heavily on food aid programmes from the international community. The food security programme of the majority of the African countries are not strong enough to sustain the drought and desertification effects. It is in this context that Africa has to address the issue of food security and the supply of food to its broad masses taking into account all the factors prevailing on the continent.

II. Food security

4. The problem of chronic food insecurity in the developing countries is essentially one of inadequate food supply and this is caused by the inability of countries to produce enough food to feed their citizens. Therefore any discussion on food problems tends to emphasize the increase in food production particularly in the developing countries where this is most needed (FAO, 1984).

5. In other discussions, the food security problem has been described as a food distribution problem (FAO, 1979). In simple terms food security means being able to produce enough food for all population groups in the country or having enough money to buy provisions in the market to feed the population. The problem of food security is primarily a problem of low income people. This is because the poor tend to spend a large percentage of their income on food.

6. Measures have been suggested to provide a practical foundation for solving the food security problem. The suggested measures are: a better distribution of available food supply and a steady increase in food production especially in developing countries in order to give them a greater degree of self reliance and to meet the needs of their growing population. Specific measures which have been suggested are (FAO, 1979):

- Provision for food reserves at community and national level;
- More rational use of the soil, water and other natural resources;
- Reform of land-tenure systems for more productive land use;
- Wide diffusion of techniques to reduce the amount of food lost between the field and table; and
- An information system to give warnings of ups and downs in weather, harvest stocks and other factors likely to affect food supply.

New measures suggested by FAO are (FAO, 1979):

- assisting developing countries in the establishment of their own national food stocks; and
- tackling post-harvest losses and storage at farm and village level.

In short, the solution of the current food security problems depends on two main actions, a rapid increase in food production and a more equitable access to food supplies.

7. In summary the food problems of the countries of Africa can be reduced to four sub-problems namely:

- The necessity to reduce the rate of population growth (in most African countries population growth exceeds food production);
- An increase in food production;
- An improvement in food storage and distribution (transportation systems); and
- Maintenance of grain stocks sufficient to make up the shortfalls caused by disturbance in production.

III. Food Security Information Systems

8. As mentioned earlier the issue of food security is one of inadequate food supply. In order to discuss the information system of the food supply, we need to address the three important components of the system which are food production, food distribution and food consumption. Data on food production constitute the core of the system. In such a system the gathering of statistics for supply to the decision makers becomes an important matter. Data needs for food security have provided the general framework for the co-ordination of statistical work of FAO, with other agencies in the field of household surveys (FAO, 1983).

9. We shall discuss the situation regarding the food supply information systems under the following headings: Food production, food distribution, food consumption and institutional framework and linkages. Our discussion will mainly focuss on the situation in Africa (Commonwealth Secretariat (1986), ECA (1986)and FAO (1983)).

a) Food production

10. Statistics on food production are gathered in most of the African countries. The main sources of the data are agriculture censuses and surveys, agro-economic sample surveys and other miscellaneous sources such as administrative reports and/or records, cadastral registers, reports from agricultural extension workers, aerial photographs, producers declarations, etc.

11. In general, most African countries have conducted decennial agricultural sample censuses as opposed to full agricultural censuses and the holding has been used as the statistical unit for the collection of the data. In some of the African countries, the censuses have been conducted by the ministry responsible for agriculture in collaboration with the central statistical agency or vice versa.

12. It should be recalled that an agricultural census is a large scale operation for the collection and derivation of quantitative information about the nation's agriculture. It provides basic data relating mainly to the organisation and structure of agriculture and to the use of agricultural resources such as manpower, land, livestock, machinery, etc. An agricultural census also provide a sampling frame for future agricultural surveys. The following types of information are usually obtained in agricultural censuses:

- Facts on agriculture land area, harvest, irrigation and numbers and kinds of livestock;

- Current estimates of crop areas and production and of livestock numbers and products;

- Data on the structure of the agricultural sector and its changes such as by size distribution of holdings, extent of various forms of land tenure, etc.; and

- Basic data regarding current use and changes in use of agricultural resources, such as manpower, land, etc.

13. African countries have faced problems in carrying out censuses. The major problems have been shortage of financial resources which have sometimes led to the postponement of the scheduled activities, shortage of skilled manpower to conduct the censuses and lack of physical resources such as vehicles and equipment, tapes, compases, etc. needed for the censuses.

14. In the area of agricultural sample surveys, most countries have now established annual surveys of agriculture with the purpose of obtaining data annually on a number of agriculture subjects including crop and livestock production statistics.

15. Two principal parameters, crop area and yield together, provide estimates of food production.

Area statistics

16. Most African countries estimate area statistics using objective techniques. There are however some African countries which continue to use subjective methods like eye estimation techniques or a combination of objective and subjective methods.

17. The following problems have been experienced by African countries in estimating crop areas:

- inadequate supply of measuring instruments - compases, tapes, etc.;
- the concept of a holding is difficult to implement given the unconsolidated nature of land in some African countries and the use of shifting cultivation practices in others;
- most countries still use household based sample frames as opposed to area frames to be able to obtain areas of holdings. These frames have been constructed from population census data. The lack of cadastral survey maps has led to this approach. Cadastral survey maps in general facilitate the collection of area statistics;
- the Central Statistical Agency or ministry responsible for agriculture usually deploy their own personnel to do crop area measurements. There is need to rationalise this system and to examine the possibility of pooling together all data collection personnel from all ministries and departments;
- measurement of crops under mixed croping, relay croping and continuous cropping have been found difficult. This is largely due to lack of accepted standards for measurement of area under these situation in most African countries.

17. In the African countries where objective techniques of area measurments have been used, several methods have been adopted. These are methods of triangulation, tape and compass, etc. In the case of mixed cropping some countries have used the seed densities method for estimating area under crops.

Yield statistics

18. Most African countries carry out objective methods of crop cutting surveys to obtain yield of crops. This is usually done in randomly selected villages and fields, some countries are still using subjective methods for yield estimation.

19. The shapes of plots used for crop cutting surveys in African countries are square, circular or rectangular. Measurement of yield of crops such as cassava, yams, potatoes have caused problems since they are in general harvested gradually by households in a piecemeal fashion and not necessarily completely during any given period of the year. The planting of the crops also tends to be scattered throughout the year.

20. Problems of moisture content have been experienced by most African countries in measuring the yield of crops. These have been solved either through proper drying until the weight of the produce is constant or by the use of instruments which measure the moisture of harvested crops and adjusting the weight of the produce thereafter.

21. African countries have used permanent or temporary staff employed by the organization conducting the survey to harvest the yield of crops. Use of other functionaries such as extension workers from the Ministry of Agriculture or other departments which do not belong to the organization conducting the survey have been lacking in the majority of the African countries. This may be due to inadequate institutional framework and linkages.

22. Most African countries have instituted early warning/crop forecasting systems. Institutional arrangements for this vary from country to country. In some countries the central statistical agency is responsible for co-ordinating the forecasts while in other countries the ministry of agriculture is responsible for co-ordinating the forecasts. In either case, a committee or committees responsible for building up the forecasts have been established in each country. It should be mentioned that these forecasts have been produced to enable planning for food procurement, storage, marketing and import/export, etc. to be undertaken. Such forecasts have also proved useful in building up national accounts forecasts for the agriculture sector of the countries.

b) Food distribution

23. One of the problems of food security in Africa is that of food distribution. Proper distribution of food depends on a number of factors some of which are as follows:

i) Availability of reliable transport facilities such as vehicles, etc.;

ii) Storage facilities at community, regional and national levels; and

iii) Prices of produce including price subsidies for major food crops.

24. In an attempt to solve food security problems in developing countries, the Food and Agriculture Organization (FAO) of the United Nations (FAO, 1979) has suggested two schemes: The first scheme is that of assisting them in the establishment of their own national food stocks and another programme is that of tackling post-harvest losses and storage at farm and village level. At the international level a range of measures have been suggested including the establishment of internationally co-ordinated food stockpiles, establishment of a global information system which would alert the world community to imminent food supply problems in particular countries or regions of the world, etc.

25. It should be mentioned that some of the African countries have established state corporation for the procurement, storage and distribution of food and the export of food crops out of the countries. These corporations have tended to face a number of problems such as lack of funds to buy produce in cash and limited and inadequate storage facilities at the regional and national level, lack of back-up support in terms of vehicles, managerial skills, etc.; and prices of produce which are fixed without recourse to data on input costs.

26. Statistics on storage, procurement and distribution of food exist in some of the African countries. These statistics assist these countries in making proper decisions regarding the distribution, procurement and storage of food. In other countries such statistics are lacking, usually due to lack of institutional co-ordination or record keeping and as such policies on food procurement, storage and distribution including pricing of food have been made without the necessary supporting statistics.

c) Food consumption

27. Once food has been produced and distributed it must be consumed by individuals in the households. There is therefore need to know the types of food consumed by the households and the quantities consumed or values of the food consumed to enable proper planning for procurement and storage of the right type of food at the local, regional and national levels to be done.

28. Statistics on food consumption are usually not only needed to establish the food requirements of a country but they are also needed for determining food policies and determination of future projections of food requirements.

29. Statistics on food consumption have been collected in some of the African countries as part of the household budget surveys. Most of the African countries have not conducted food consumption surveys. In African countries where the African Household Survey Capability Programme (AHSCP) has been established, there are plans to conduct food consumption surveys as one of the modules. It should be mentioned that nutrition surveys generally sponsored by the United Nations Children Fund (UNICEF) have been conducted in many African countries with the purpose of securing alternate proxy indicators on the health status of the population particularly those under the age of five.

d) Institutional Framework and Linkages

30. In many African countries many agencies separately collect statistics on food. The institutional linkages are either lacking or weak and in those countries where linkages exist they certainly need strengthening.

31. Issues of co-ordination among data producing agencies as well as collaboration between producers and users of statistical data continue to be addressed in most of the African countries. Through inter-ministerial technical committees, co-ordination of rural development and its data requirements are usually discussed. Some countries have been able to organize monthly or quarterly meeting in the ministry of agriculture for the purpose of discussing issues relating to data collection, processing, analysis and dissemination.

IV. Food Secuirty Information Systems in Selected Countries

32. In this section of the paper examples of food security information systems in India, Kenya and Ethiopia will be provided. In India the food security system is well established while in Kenya and Ethipia the systems continue to be developed.

33. A comprehensive and well organized system of collecting statistics on food supply has been established in India. The data which are collected for the system range from those of production to those of consumption. Several agencies are involved in the food supply information system including ministries, departments and institutions. The linkages between these agencies are complementary and non-overlapping.

34. It should be mentioned that in India agriculture is a state matter, the collection and dissemination of agricultural statistics is the primary responsibility of state governments hence estimates of production of food are made by states and Union Territories on the basis of area and yield estimastion surveys conducted on a random sampling basis. The state and Union Territories have a public distribution system for food grains and sugar. The Food Corporation of India is responsible for the maintenance of the public distribution system and the maintenance of the national buffer stock. A schematic presentation of the Food Supply Information System in India is given in the Annex of this paper.

35. In Kenya, the Central Bureau of Statistics (CBS) runs a national food system in collaboration with a number of other government agencies. The CBS has received assistance from the Food Studies Group of Oxford, United Kingdom in the implementation of the national food system.

36. In Ethiopia the Relief and Rehabiliation Commission in colalboration with other government agencies has been monitoring the performance of the crops through the Food and Nutrition Surveillance Programme. Reports on the performance of crops and on the food supply situation are issued regularly. This programme helps to identify areas expecting food shortage and those expecting surplus production ahead of time. An early warning system through which reports are produced covering data on rainfall, crops and livestock condition and price of grains has been established. Reports on crop prospects, food supply status and forecast are issued regularly.

37. In Ethiopia there also exists a market dependent Food Supply System which covers the market dependent population of the nomadic, urban and cash crop producing rural population. It became necessary to establish this system because these people depend entirely on the market for their food supply. Information on the prices of food in the markets and the supply of food has provided good indicator on the food supply status of the market dependent population.

V. Improvement of Food Security Information Systems

38. As mentioned earlier in order to improve food security information systems, there is need to ensure that relevant data required for the system are available. The data required include information on food production, food distribution and food consumption. In addition there is need to strengthen the institutional framework and linkages for the collection, processing and dissemination of data.

39. In the area of agricultural censuses and surveys, these should be considered by the countries as an integral part of their statistical work. For the countries which conduct these censuses/surveys on a regular basis, questions of coverage and the quality of data need to be addressed. For countries which do not conduct these censuses/surveys on a regular basis there is need to include these censuses/surveys in their statistical programmes. In particular, agricultural censuses need to be reinforced by a programme of annual sample surveys.

40. Specific surveys should also be conducted by countries in order to strengthen the system. These surveys should be conducted in the areas of food consumption, livestock, farm practies and cost of cultivation. There may be need to conduct livestock censuses in order to strengthen the information obtained through the survey approach.

41. There is need to further strengthen crop forecasting and early warning information systems which many countries have established. In particular crop yield forecasts need to be compared with the results obtained through censuses and surveys in order to determine whether the forecasts were nearer or far from the results estimated through the conventional approach.

42. With respect to institutional framework and linkages, there is need to institute in each country effective co-operation and co-ordination among data collection agencies. This co-operation and co-ordination can best be promoted by the National Statistical Office of each country. The head of the statistical service has an important role to play in this regard. There are several ways of doing this either through the user/producer committees, meetings, publications or informal contacts. Perhaps one way of ensuring linkages is for the national statistical office to introduce publications which require institutions that produce the relevant data to report to it. It is through this way that the information supplied by institutions can be checked to ensure consistency with information produced by other agencies, including the national statistical office. It should be mentioned that the use of non-statistical functionaries such as extension or revenue collection staff in other government agencies of the countries needs to be strengthened. This should be in addition to the permanent or temporary staff available at the institutions. The establishment of statistical units in other government ministries/departments and where possible parastatal and private sector companies would enable the strengthening of institutional linkages in each country. The establishment of regional statistical offices in each country would also help in strengthening institutional linkages since these offices would be in a position to contact those institutions in their region much more easily.

43. Another area which needs to be looked into in order to strengthen the food security information system is that of research, experimentation and training. It should be noted that most of the methodologies used in Africa for the collection of statistics are those which have been found to work in developed and other developing countries in the world. There is therefore need to develop methodologies appropriate to African conditions. To do this there is need for some form of research and experimentation including training.

44. In order to conduct research and experimentation, appropriate institutions should be chosen to do this. In this connection there is need to ensure that such institutions also conduct training since the findings of their research and experimentation work will eventually be taught to potential workers in the field of data collection.

45. It is relevant to mention that at a commonwealth workshop (Commonwealth Secretariat (1986)) which was organised in New Delhi, India in 1986 on Food Supply Information Systems, two teaching and research institutions in English-speaking African countries were identified by the workshop as suitable institutions for conducting work on research and experimentation in the field of agricultural censuses and surveys. The institutions are the Institute of Statistics and Applied Economics (ISAE), Makerere University, Kampala, Uganda and the Department of Statistics, University of Ibadan, Nigeria. It is also relevant to mention that these two institutions are among the fifteen Statistical Training Programme for Africa (STPA) centres and are to be strengthened through the regional component of the STPA in their post-graduate training programmes.

46. Research and experimentation can focus on a number of problems which have been experienced by African countries in an attempt to obtain data required for food security information systems. Examples of such problems are sample design appropriate to the African situation, crop cutting surveys and the logistics, measurement of fields, frame construction (household versus holding), establishment of appropriate norms and conventions suitable for African conditions, appropriate storage of food crops, etc.

47. In order to benefit from institutions which have conducted such programme of research and experimentation, there is need for formal twinning/linkage of institutions. The Economic Commission for Africa could facilitate such arrangements in view of its relationship with teaching and research institutions in and outside Africa within the framework of the STPA.

48. Finally in the area of food distribution, most African countries should establish statistics on the quantities and volume of food which has been stored in the silos, etc. Statistics on the distribution of the food to regional and district centres should also be established and be kept up to date. These statistics provide useful indicators on the situation regarding the available food for the population at any one time. In addition to these statistics, there is need to gather statistics on market prices of food. These are important for decisions on price subsidies, etc.

VI. Conclusion

49. In this paper a brief description of food security problems and the measures for solving the problems has been given. The food security information system and its components has been described including the institutional framework and linkages required for the information system.

50. The food security system has three basic components namely: food production, food distribution and food consumption. The food production component constitutes the heart of the system. Two principal parameters, crop area and yield together provide estimates of food production. Regarding the institutional framework and linkages for the system, the issue of co-ordination among data producing agencies as well as collaboration between producers and users of statistical data have been discussed.

51. Examples of food security information systems in India, Kenya and Ethiopia have been provided in the paper.

52. Suggestions have been made for improving food security information systems at the country level. The collection of data through agricultural censuses including censuses of livestock and annual surveys of agriculture have been mentioned. These provide a wealth of information for the building up of the food security information systems. Specific surveys on food consumption, livestock, farm practies and cost of cultivation have been mentioned and these provide information which strengthen the system. The strengthening of crop forecasting and early warning informational systems and institution linkages has also been mentioned. The National Statistical Agency of each country has an important role to play in fostering institutional linkages.

53. The conduct of research, experimentation and training has been mentioned as one way of contributing to the improvement of data for the system. Through research, the quality of data can be improved and methodologies for collecting data can be established.

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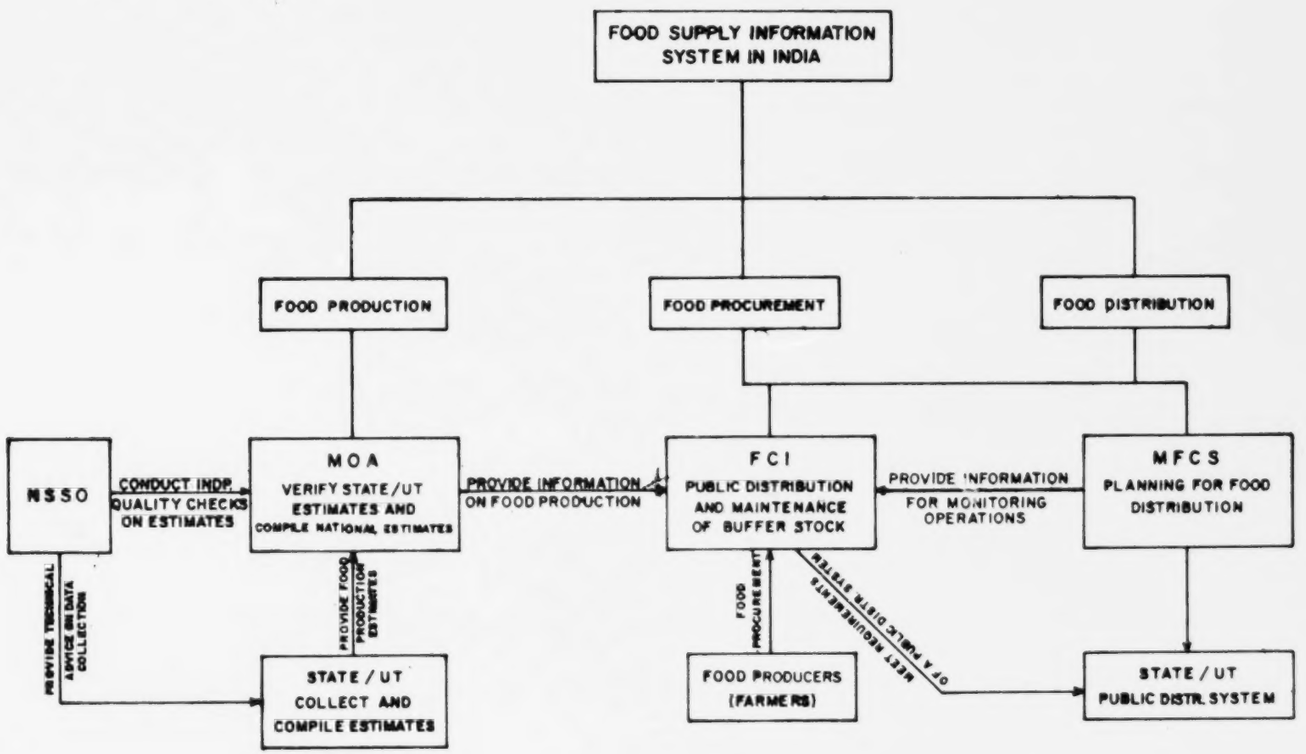
SCHEMATIC PRESENTATION OF THE FOOD SUPPLY INFORMATION SYSTEM IN INDIA


FOOD SUPPLY INFORMATION SYSTEM IN INDIA
FOOD PRODUCTION
FOOD PROCUREMENT
FOOD DISTRIBUTION
NSSO
CONDUCT INDP. QUALITY CHECKS ON ESTIMATES
MOA
VERIFY STATE/UT ESTIMATES AND COMPILE NATIONAL ESTIMATES
PROVIDE INFORMATION ON FOOD PRODUCTION
FCI
PUBLIC DISTRIBUTION AND MAINTENANCE OF BUFFER STOCK
PROVIDE INFORMATION FOR MONITORING OPERATIONS
MFCS
PLANNING FOR FOOD DISTRIBUTION
PROVIDE TECHNICAL ADVICE ON DATA COLLECTION
PROVIDE FOOD PRODUCTION ESTIMATES
FOOD PROCUREMENT
MEET REQUIREMENTS OF A PUBLIC DISTN SYSTEM
STATE / UT COLLECT AND COMPILE ESTIMATES
FOOD PRODUCERS (FARMERS)
STATE / UT PUBLIC DISTR. SYSTEM

NSSO = National Sample Survey Organisation of India
MOA = Ministry of Agriculture
UT = Union Territories
FCI = Food Corporation of India
MFCS = Ministry of Food and Civil Supplies